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Realising the Benefits of Sports and Physical Activity: The Human Capital Model Materializando los beneficios del deporte y la actividad física: El modelo de capital humano

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Abstract. Despite the fact that physical activity is universally acknowledged to be an important part of healthy functioning and well being, the full scope of its value is rarely appreciated. This paper introduces a novel framework for understanding the relationships between physical activity (and specific forms of activity like sports) and different aspects of human development. It proposes that the outcomes of physical activity can be framed as differential 'capitals' that represent investments in domain-specific assets – Emotional, Financial, Individual, Intellectual, Physical, and Social. These investments, especially when made early in the life course, can yield significant rewards, both at that time and for years to come. The paper also outlines some of the conditions necessary for the realization of Human Capital growth through sports and physical activity, focusing on the social factors that influence participation for children and young people.

Key words. Sport, Physical Activity, Human Capital Model, Children, Young, People

Resumen. A pesar de que la actividad física es reconocida universalmente como una parte importante del funcionamiento saludable y el bienestar, el alcance total de su valor es raramente apreciado. Este artículo presenta un novedoso marco para la comprensión de las relaciones entre la actividad física (y formas específicas de actividad como los deportes) y diferentes aspectos del desarrollo humano. Propone que los resultados de la actividad física pueden enmarcarse como 'capitales' diferenciales que representan inversiones en activos relacionados con ámbitos específicos - emocional, financiero, individual, intelectual, físico y social. Estas inversiones, especialmente cuando se realizan pronto en el curso de la vida, pueden dar ventajas significativas, tanto en ese momento como en los años venideros. En el documento también se describen algunas de las condiciones necesarias para la realización de un crecimiento del capital humano a través del deporte y la actividad física, centrándose en los factores sociales que influyen en la participación de los niños y los jóvenes.

Palabras clave. deporte, actividad física, modelo capital humano, niños, jóvenes

Introduction

The Human Capital Model (HCM) is the result of an attempt to draw together an evidence base of the extensive and varied benefits of sports and other physical activities (Bailey, Hillman, Arent & Petitpas, 2012; 2013)¹. It is part of a wider research and development initiative – Designed to Move – which is supported by an international, multi-sectoral group of governmental and non-governmental agencies, sports organizations, and businesses, coordinated by Nike, Inc., The American College of Sports Medicine, and the International Council of Sport Science and Physical Education².

The starting position of Designed to Move, which underlies the development of the HCM, is that despite the mounting evidence of the benefits of sports and physical activities, there continues to be a general under-appreciation of the importance of sports and physical activity – both to individuals and the wider society. When the value of sports and/or physical activity is discussed, at all, it tends to focus on a narrow range of issues, such as obesity and coronary heart disease. Physical health is important, of course, but it represents only a fraction of what the empirical base suggests are the full benefits of sports and physical activity. Since the positive outcomes of sports and physical activity are not autonomous and disconnected – they reinforce each other – the true value of sports and/or activity can only be properly appreciated from a very broad holistic perspective.

Underlying the HCM is an assertion that the stock of competencies, knowledge and personal attributes are embodied in the ability to take part in sporting and other physical activities, and that these activities produce value that are realized through increased well-being, educational achievement and, ultimately, economic value. This is not to suggest that the importance of sports and physical activity is overlooked by policymakers or the wider society. Indeed, there is increasing acceptance that regular sports and physical activities form an important and necessary feature of healthy living and development precisely because of the consequences of inactivity. However, the evident escalating costs to personal and societal well-being suggests that there remains an urgent need to gather, analyze and present a coherent and compelling framework of the state of the science³.

The Physical Inactivity Pandemic

Globally, the major cause of death and disability are non-communicable diseases like obesity, heart disease and stroke, cancer, chronic respiratory disease, and diabetes. The World Health Organization (WHO) estimated the annual worldwide tally to be 35 million people per year dying of these chronic diseases, which is double the number dying from all combined infectious diseases, like HIV/AIDS and malaria (WHO, 2005). For the first time in history, children have a shorter lifespan than their parents due to non-communicable diseases (Wang & Veugelers, 2008). Aside from the human cost, there is a huge financial loss: in 2005 alone, the estimated losses in national income from heart disease, stroke and diabetes were \$18 billion in China, \$11 billion in the Russian Federation, \$9 billion in India, and \$3 billion in Brazil (IWG, 2008).

The importance of sports and physical activity for most policymakers and politicians lies in its status as the least expensive and most effective preventive treatment for combating the increasing worldwide problem of obesity. With its associated physical fitness, it may represent the most effective strategy to prevent chronic disease (Bonow, Smaha, Smith, Mensah & Lenfant, 2002). The relationship between sedentary behaviors and prevalence of obesity has been well documented. Although it is only one factor in a myriad of influences, the amount of sports and physical activity in which people engage is linked to their status of being overweight or obese.

In light of this situation, it is not surprising that sports and physical activity has increasingly become associated with a rather narrow equation: «Exercise is Medicine» (American College of Sports Medicine, 2011). Sports are valuable in policy term, therefore, because they are a popular form of exercise; they are a palatable medicine. They are also effective medicine, as sports participation is associated with higher overall levels of physical activity (Pate, Heath, Dowda & Trost, 1996). Increasing participation in sports forms a core objective across a range of government policies in most developed countries. Of course, there are other aspects of sports that grab the attention of politicians from time to time (such as the adventures of the European Soccer 'Super Leagues' or the Olympic Games). In general, though, the wide-scale development of sports and other physical activities has become a policy target because of their significance for health care systems and economies in general (Breuer & Pawlowski, 2011).

It is now beyond doubt that regular physical activity during childhood and adolescence is an important part of the foundation of a happy, healthy and longer life. The serious dangers associated with

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inactive lifestyles are equally clear, such as heart disease, diabetes and obesity. It is not surprising that scientists, medical professionals and public bodies have expressed serious concerns that current levels of sports and physical activity among children and young people are inadequate, and that most children and young people around the world fail to meet recommended daily levels of activity (Sisson & Katzmarzyk, 2008). Some studies suggest that the pattern of childhood and adolescent activity in the developed world, and at an increasing rate, in the developing worlds is getting worse (Beets, Bornstein, Dowda & Pate, 2011). In the language of one recent consensus statement, there is a 'pandemic' of inactivity (Craig et al., 2012).

Many authorities suggest that children and young people should build up at least 60 minutes of moderate intensity physical activity every day, and at least three times a week to accrue these benefits (e.g., Britain & Donaldson, 2004). Unfortunately, there is ample evidence that not all children and young people spend enough time being physically active. Data show a consistent pattern in most developing countries: many children and young people are not meeting the required levels of physical activity. For example, evidence from England shows that only 32 percent of boys and 24 percent of girls achieved the recommended levels of physical activity (Craig, Mindell & Hirani, 2009). The general pattern, which is broadly representative of the developed world, as a whole, suggests a gradual reduction in levels of sports and physical activity from childhood through adolescence, with a drop-off that is particularly striking among girls (barely one in ten 14 year-old girls in

the United States meet the activity recommendations; Evans, Sheila, Kirk & Crombie, 2009).

The Human Capital Model

Within the context of rising incidents of non-communicable diseases and declining levels of sports and physical activity it is hardly surprising that discussions of the benefits of sports and other physical activities, especially for children and young people, are traditionally framed in the context of the future physical health status of the individual and its consequences for the community. However, this is a limited and rather unhelpful paradigm for a number of reasons. First, it is important to consider sports and physical activity as it relates to the multiple demands of childhood and adolescence associated with physical growth, biological maturation, and behavioral development (Bailey et al., 2009; Collins et al., 2012). These processes vary considerably among individuals, occur simultaneously and interact, and provide the backdrop against which children and young people evaluate their own status among peers, especially during adolescence. This backdrop has implications for many decisions children and young people make, including those about sports and physical activity. Second, outcomes of involvement in sports and physical activity extend far beyond physical health, taking in psychological and social well being, cognitive and academic performance, and even future careers (Bailey, 2006). Third, the view that 'exercise is medicine' leaves little room for the self-determined motivations and significance of activity in the lives of children and young people (Standage, Duda & Ntoumanis, 2003).

The HCM seeks to take a broader and more inclusive view of sports and physical activity; one that takes on board the urgent health agenda, but that locates that agenda in a holistic view of human development. In doing so, it acknowledges the WHO's working definition of health: «a complete state of physical, mental and social well-being, and not merely the absence of disease or infirmity». The HCM represents the view that sports and physical activity is a fundamental part of human nature, and that it is essential for healthy human development. It frames development in terms of different forms of 'capital' - physical, emotional, social, individual, intellectual, financial - resources that can be built on and drawn on throughout life (see Figure 1). The use of the language of 'Capitals' is deliberate and suggests that sports and physical activity is an investment capable of delivering valuable individual and social returns (Becker, 1964). The model suggests not only that sports and physical activity is a key driver of different types of capital formation, but that the capitals in turn influence both physical activity and each other, thus forming a synergistic feedback network whose whole is greater than the sum of its parts.

As can be seen, the HCM presents a synthesis, analysis and reconceptualization of the available scientific evidence related to the outcomes of sports and other forms of physical activity. Other

THE HUMAN CAPITAL MODEL

The comprehensive benefits of physical activity, sports and physical education are underestimated today. This model shows the spectrum of benefits to an individual and economy. Each "capital" refers to a set of outcomes that underpin our well-being and success.



Figure 1: The Human Capitals

presentations added quality judgments regarding the claims within each Capital - differential weightings were given to findings based on the qualities and scope of the studies (e.g., range of institutional settings, international applicability, etc.) - and these judgments significantly influenced both the scientific review (Bailey et al., 2013), and its translation into policy-related messages (e.g., Nike, 2012 https://www.designedtomove.org/en_us/).

Evidence related to the relationship between sports, physical activity and human development was then modeled according to six different domains of capital: 1) physical; 2) emotional; 3) individual; 4) social; 5) intellectual; and 6) financial:

1. **Physical Capital:** The direct benefits of sports and physical activity to physical health and human function, including the prevention and mitigation of non-communicable diseases and conditions, such as heart disease, diabetes, cancer, and obesity.

2. **Emotional Capital:** The psychological and mental health benefits associated with sports and physical activity, including increased levels of self esteem and self efficacy, reduced depression and anxiety, reduced social isolation, and a greater ability to process stressful events.

3. **Individual Capital:** The elements of a person's character—e.g., life skills, interpersonal skills, values—that accrue via participation in play, sports and other forms of sports and physical activity. Reported benefits in this area include teamwork, co-operation, moral and social responsibility, and resilience.

4. **Social Capital:** The outcomes that arise when networks between people, groups, organizations, and civil society are strengthened because of participation in group-based physical activity, play, or competitive sports. This domain of capital includes the development of both pro-social behaviors and social inclusion through participation in physical activity.

5. **Intellectual Capital:** The cognitive and educational gains that are increasingly linked to participation in sports and physical activity. This feature of capital focuses particularly on the effects of regular exercise on cognitive functioning, on subject-specific performance at school, and on general academic achievement.

6. **Financial Capital:** Gains in terms of earning power, job performance, productivity and job attainment, along with reduced costs of health care and absenteeism/ presenteeism (i.e., lower productivity among those who are «present») that are linked to regular sports and physical activity participation.

Each of these Capitals represents a set of important investments to human health and well being. However, it also needs to be remembered that they act synergistically. For example, the development of Intellectual Capital has been shown to have significant positive effects on Financial Capital, and the effects of increased Social Capital are felt in each of the other Capitals. So, while it might seem sensible to focus on specific types of outcomes (such as combatting obesity, or reducing social exclusion), there is a danger of missing a much more compelling story about the role that sports and physical activity can make to human well being as a whole.

Early Positive Experiences

Whilst the empirical base of theories of sports and physical activity outcomes, like the HCM, is growing rapidly, it is also clear that the realization of these outcomes is not simple and unproblematic. On the contrary, engagement in sports and physical activity is mediated by a range of factors that incline children and young people towards or away from sports and/or activity. Some of these factors have the status of determinants, since their presence are necessary criteria for participation. Accessible and safe facilities, equipment, and coaching might be considered determinants of certain forms (a horse is necessary to take part in show jumping; access to snow is vital if one wishes to be become a downhill skier!). Many other factors have a less direct influence, but nonetheless can prove extremely potent, especially when they occur together. Sallis and Owen (1999) usefully classified the correlates of physical activity in terms of Intrapersonal, Social, and Environmental Variables. According to the HCM, the host of determinants, correlates, causal variables,

mediators, moderators, and confounders stimulate or inhibit the value of the different capitals (see Figure 2).

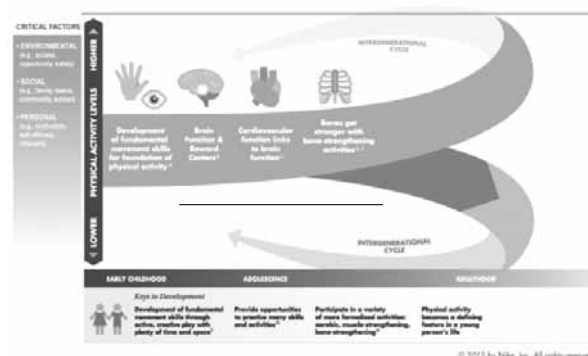


Figure 2: Human Development and the Human Capital s
For sources, see Bailey, Hillman, Arnt and Petitpas (2013).

At a time when rates of childhood and adolescence inactivity are rising to the extent that they are causing wide-scale alarm for the harm to health, both now and later in life, the urgency of rethinking the ways in which activity is presented to children and young people could hardly be greater. Early experiences are important as they set the tone for everything that follows. Simply put: positive experiences encourage further participation, whilst negative experiences budge towards permanent dropout. The ways in which sports and physical activity is presented are significant with all populations, but there are particularly compelling reasons to focus on first experiences as they start a pattern for all that follows. If the earliest experiences of sports and/or activity are uninspiring, boys and girls will not want to continue, and evidence suggests that inactive children are likely to become inactive adolescents, and inactive adults (Craigie, Lake, Kelly, Adamson & Mathers, 2011; Janz, Burns & Levy, 2005).

An implicit goal for adults involved with children and young people in sports and other physical activities, therefore, is that they continue to participate and remain active beyond their childhood years (Siedentop, 2002). Early positive experiences create an important foundation for lifelong engagement as they help create the positive affect through which sports and physical activities become part of a daily routine (Kjonniken, Anderssen & Wold, 2009). In fact, positive experiences are only half of the equation, as adults are faced with two sub-goals, that could be said to underlie everything else that they do in the sports and physical activity context: maximize positive experiences and minimize negative experiences. In fact, the metaphor of an equation ought not be taken too literally, as positive and negative experiences do not constitute evenly weighted scales that determine an outcome. Just as a singular inspiring experience inspire a lifelong commitment to a domain (Pickard & Bailey, 2009), one negative encounter can undermines years of enjoyable sporting and physical activities (Smoll & Smith, 1996).

It is becoming increasingly apparent that social factors are particularly significant factors related to engagement in sports and physical activities. The presence of significant others (e.g., parents, friends, siblings, coaches, teachers, and teammates) may have a significant influence on the sport experience (Partridge, Brustad & Babkes Stellino, 2008). Given the option, relatively few people choose to engage with activities on their own, and once they have started, social climate and affiliation can be powerful motivators for remaining. In light of its importance, it is not surprising that researchers have traced the positive and negative responses to sports and physical activity to primarily social factors. In fact, both children, adolescents and adults tend to define the quality of their sporting experiences in terms of socially orientated perspectives (Allen, 2003).

The social dimension of motivation has been well explored by researchers. One theme, which has emerged is that of social bonds. It has been suggested that these bonds are important elements of healthy functioning, and that the need for bonds explains the tendency to seek

out social interactions and build relationships. A consequence of this is that people gain positive feelings from forming and sustaining social bonds, and negative emotions when relationships are broken, threatened, or refused (Baumeister & Leary, 1995). Sports and similar physical activities are among the most common settings in which children and young people can develop social relationships and feel that they are part of a group.

A second theme from research relates to social approval. It has been suggested that the approval by others can incline people towards participation in some activities, and it can also influence the affective response to those experiences. The power of social approval appears to be strongest among children and young people. For example, one study found that young people define positive and negative experiences through socially oriented perspectives, such as contributing to the team, social support and approval, pleasing others, and affiliation (Schilling & Hayashi, 2001).

A third theme from research into the social side of motivation to engage in sports and physical activities is social cognition, and it has proved extremely popular among sports and exercise scientists (e.g., Gandhi, 2010; Humpel, Owen & Leslie, 2002). Based on the work of Bandura (2001), this approach posits that social factors serve as important influences on behavior, as they provide feedback for behaviors, opportunities, and consequences of actions. The degree of this influence varies according to different contextual factors, such as social support, family and peer influences, and access to resources (Booth, Owen, Bauman, Clavisi & Leslie, 2000). According to Bandura's theory, human behavior is understood as a triadic, dynamic, and reciprocal interaction of personal factors, behavior, and the environment. Satisfying experiences occur when an individual has positive, personal characteristics, exhibits appropriate behaviors, and stays in a supportive environment.

The fourth and final theme is social development, linked to the work of Bronfenbrenner (1993), which theorizes that behavior needs to be considered as a function of developmental status as it interacts with the environment. From this perspective, the developing individual is not a stable entity; s/he is engaged in a dynamic process of development and change. So, social influencers on behavior need to be understood in relation to the individual's stage of development.

There are evident differences between these different theoretical frameworks, and these ought not be ignored. However, it is also possible to identify a core of shared presumptions about social influencers on human activities like sports and physical activities. For example, such influencers need to be understood as parts of a complex and dynamic whole that are inherently connected, so that change in one part of this web of interconnectedness will result in changes elsewhere, too (Bailey et al., 2009). So, while the focus in this discussion is on children and young people it is important to acknowledge that these influencers are not unilinear: there is always a reciprocal relationship: the family influences the behavior and actions of its children, who influence their family, which influences the wider community, which influences the family, and so on (Côté, 1999).

Parents

Parents are uniquely important social influencers for sports and physical activities. They are the first and most enduring presenters of activity to children and young people, and have been found to influence their children's experiences of exercise in a number of ways. For example, parents have been found to have the greatest influence on children's perceptions of sport competence, particularly during childhood (Horn & Weiss, 1991), and these perceptions can have powerful effects on children's willingness to enter the activity spaces. Parents can also provide practical support, including paying for lessons and equipment, providing transportation, providing emotional support, and also give their children a sense of their and the community's perceptions of which activities are most suitable, valuable and acceptable (Babkes Stellino, Partridge & Moore, 2012).

A useful model for conceptualizing the relationships between

parental influence and children's views of their own competence is the 'expectancy-value model' (Eccles & Harold, 1991). According to this model, socialization behaviors are influenced jointly by parental expectation for the child's success in a given area and the value parents place on this success. Parents who expect that their children can be successful in sports and physical activities and who value success in this area will be more likely to influence their children to pursue this behavior. Adults' beliefs often express cultural norms and prejudices, and the model predicts that these norms will significantly influence the messages they put across to their children. So, the common acceptance by parents of gender-role stereotypes translates into values and expectations that boys ought to be more physically active than girls, and that activities should be strictly delineated according to gender. This can establish a self-fulfilling prophecy whereby the idea that girls and boys are essentially different becomes validated by progressively differing experiences and rewards (Welk, 1999a). (It ought to be noted at this point that many of the constructs that have been developed from research with parents apply well to other social influencers. The expectancy-value model, for example, could easily be adapted to relate to the effects of peers' beliefs on young people's behaviors, or on teachers' and coaches' social control over children)

There are various ways that parents (and other social influencers) can socialize their children to be physically active. Five different parental socialization variables especially influence physical activity behaviors::

- Initiate
- Encouragement
- Involvement
- Facilitation
- Role Modeling

Children's first involvement in sports and physical activities is usually as a consequence of their parents, and they are therefore, initiators of their child's participation. For example, in studies by Light and colleagues (e.g., Light & Lemonie, 2010; Light, Harvey & Memmert, 2013) a common finding was that children originally joined sports clubs because their parents had in some way either influenced their decision, enrolled them at a sports club, or had been the main reason why they first started participating. A further study revealed that talented children's early involvement was heavily dependent upon their parents introducing them to sport, particularly in the case of swimming, with 70 per cent of children sampled citing this as their reason for initially taking part in this sport (Baxter-Jones and Maffulli, 2003).

Children and young people rely heavily on their parents (and, to a lesser extent, other adults) as sources of information regarding their physical abilities, and this perceived physical competence is strongly associated with involvement with sports and physical activities (Welk, 1999b). Parental encouragement influences children and young people's level of sports and physical activity, in part, by enhancing their perception of physical competence (Edwardson & Gorely, 2010). This suggests that parents wishing to promote their children's sporting and physical activity involvement would be well-advised to focus on building their physical competence and a sense of confidence in movement domains.

Parents become involved in their children's sports and physical activities in many ways, including teaching new skills, helping them practice, observing sessions, and introducing new forms of sports and physical activity (Walters, 2011). It seems that the most efficacious level of parental involvement is something of a balancing act between under- and over-involvement (Gould, Lauer, Rolo, Jannes & Pennisi, 2008). The former implies that parents do not value sports and physical activity, the latter that they have attached an inappropriate degree of seriousness. Both of these forms are associated with children's reduced motivation to remain engaged with sports and other physical activities (Grolnick, Deci & Ryan, 1997). Research suggests that parents need to be supportive of their children's sports, but not overly directive. The latter, in particular, is a cause for concern as it can become a source of excessive pressure on children which is associated with drop-out once the child has the opportunity to do so (Fraser-Thomas & Côté, 2006).

Parents can do a number of things to facilitate their children's

sports and physical activity, such as meeting the costs of facilities and equipment (Miller, 2011). Many forms of sports and physical activity are free and almost universally available, but sports participation is often mediated by parents' ability and willingness to pay. For example, Harwood and Knight (2009) found funding their children to play tennis to be costly and stressful, with the amount it costs increasing dramatically if their child turns out to be talented (Kirk et al., 1997). In fact, such are the financial and time costs of participation in certain sports that some parents refuse to fund them (Hardy, Kelly, Chapman, King & Farrell, 2010).

Finally, for this theme, there is little doubt that parents form the main role models for children. Indeed, the importance parents place on sports and physical activity through their own involvement has been found to significantly influence the involvement of their child (Anderssen & Wold, 1992). Parents are the most sustained providers of social messages, compensating for their children's immature social skills. At the same time, children rely on their parents for feedback on their own competencies (Brustad, 1996).

While there are many ways in which other people can influence the sports and physical activity of children and young people, studies tend to suggest that the relationship between parental engagement and childhood activity is particularly strong. 11 and 12 year-old children with one or two active parents are much more likely to be physically active themselves, and that relationship seems to be linear (the more active the parents, the more active the children) (Mattocks et al., 2008). Children with active mothers or active fathers have been found to be twice as likely and three and a half times as likely, respectively, to be active when compared with children of inactive mothers. Children with two active parents are nearly six times more likely to be active (Moore, Lombardi & White, 1991). These and many other studies around the world suggest that parental engagement is the strongest predictor of sports and physical activity levels in both boys and girls (McMinn, van Sluijs, Wedderkopp, Frobers & Griffin, 2008).

Parents hold a virtual monopoly on social influence until the beginning of school, after which children are exposed to a wider range of people (Payne, Reynolds, Brown & Fleming, 2003). During the early years, sports and physical activity tends to be play-based, rather than structured and formalized (Pellegrini & Smith, 1998). As children move to school-age, they are introduced to a variety of sports, most often by the father. The playful attitude to movement remains, driven by a sense of fun and enjoyment derived from the activities themselves. As children move through their elementary schooling, parents often hand primary responsibility for instruction to a coach, and focus their efforts more on providing logistical support or participation. Later childhood and the teenaged years are often characterized by a shift in motivation from fun and play towards skill learning and specialization in a small number of sports (Côté & Hay, 2002). By the time the person has reached their 20s, their parents' role is mainly one of emotional support (Partridge et al., 2008).

Siblings

The role of brothers and sisters as social influencers has not received as much attention from researchers as have other factors. This is strange, as siblings are likely to form the longest relationships in life for the 95% of people who have them. Despite being overlooked by sport science research, there are good reasons to believe that the sibling relationship is a significant form of social influence throughout life, partly because of its endurance and partly because of the distinctive nature of sibling's interactions (Cicirelli, 1995).

It seems reasonable to suppose that relationships that are closest will have the strongest effect on the development of behavior. This is probably why social influence is ever-changing and overlapping, and the extent of the influence depends partly on the location, time of day and context of sporting activity being examined (Spence & Lee, 2003). It does seem to be the case that, throughout much of childhood, siblings usually spend more time together than they do with their parents, and that the intensity of this interaction is greatest during the early years,

although it later extends to out-of-school time, too. As with parents, siblings' roles as social influencers are strongest when the athlete is a child, and progressively weakens as they move into adolescence.

Generally speaking, findings suggest that siblings form part of the dynamic family support system that effects sports people at every stage, although the extent of that influence varies significantly at different points of time (Davison, 2004). Empirical research, and to some extent psychological theory, has sometime characterized sibling relationships in terms of rivalry and jealousy (the 'classic' example of this is, perhaps, Sulloway, 1996). Sports research, however, suggests that siblings who play sports, and engage in physical activities together are as likely to be cooperative and supportive (Davis & Meyer, 2008), especially when the children or young people are each able to express their uniqueness and work out their own niche within the family unit. However, such is the dynamic complexity of sibling roles within the family that research has generated somewhat contradictory findings: for example, some have suggested that brothers can exert a strong influence over their sister's sporting participation, while others have found no effect (Greendorfer, Lewko & Rosengren, 2002).

There is compelling evidence that older siblings play a central role in guiding and reinforcing their sibling's sports participation (Anderssen & Wold, 1992). Case studies of talented athletes and dancers reveal that older siblings are among the most common role-models, inspiring and encouraging their younger family members to begin their sport in the first place, and guiding them towards norms of behavior and approach (Côté, 1999; Pickard & Bailey, 2009). It has also been found that inactive older siblings have a more detrimental effect on the child's likelihood to be active than having no sibling at all (Partridge et al., 2008).

Peers and Friends

Generally speaking, most theories of social influence on child development assume the central role of the parents. However, relatively recent research has claimed that parents matter much less than is typically assumed, at least when it comes to determining the behavior of their children. Instead, these researchers argue that a child or young person's peer group is far more important (the best-known example is Harris, 2011). With regard to sports and physical activities, this position appears to be somewhat implausible, at least when considering the whole phase from childhood to early adulthood. Nevertheless, an increasing amount of evidence has demonstrated that peers have a significant effect on the sports and/or physical activity of children and young people (Salvy et al., 2008).

Peer influence can be both positive and negative, as is the case for all forms of social influence. For example, children and young people tend to be more physically active in the presence of friends in an unstructured setting (outside of school) than when they are alone. However, some children and young people (especially those overweight) become less active in more formal settings (like school physical education lessons) in the presence of peers (Rittenhouse, Salvy & Barkley, 2011). This pattern seems to be caused by the rejection of peers who are less physically fit or competent (Gray, Janicke, Ingerski & Silverstein, 2008). Peer rejection can damage self-esteem and social engagement, which can result in further rejection of sports and physical activities, and the establishment of sedentary habits. On a different note, positive sporting and physical activity experiences can provide children and young people with opportunities to be with friends, developing close relationships, and gaining recognition and social status (Rubin, Bukowski & Parker, 2006). In fact, friendship and social acceptance seem to be motivations in themselves, associated with fun and enjoyment, and sports and physical activities often follow the pursuit of these experiences. However, the relationship becomes reciprocal as physical competence and appearance are viewed by young people as key social status determinants (Chase & Dummer, 1992).

The greatest significance of peer social influence comes with adolescence. With adolescence comes an increase in the time spent with peers; teenagers report that they spend more time with their friends than with family members or on their own, which represents a significant

developmental change compared to childhood (Savin-Williams & Berndt, 1990). As well as influencing time use, peers also effect adolescents' decisions about the seriousness of their involvement in activities. This is a time when young people turn towards their friends (and away from family and school) for social support. So, perhaps it is not surprising that the onset of adolescence coincides with dramatic changes of sports participation, especially for girls (Bailey, Wellard, and Dismore, 2004). For many girls, impressing boyfriends and other peers is seen as more important than sports and physical activity, and while many of them wanted to be physically active, a tension existed between wishing to appear feminine and attractive and the sweaty muscular image attached to active women (Krane, 2001). These changes do not necessarily result in a rejection of sports and physical activities, as the peer group can strengthen young people's perceptions of themselves as sporting people, so that sports become closely linked to a sense of identity as a person.

School

Sports in school represent the main societal institution for the development of physical skills and the provision of sports and physical activity in children and young people (Bailey, 2006). For many, school is the main environment for being physically active, whether through physical education lessons or after school activities (Telama, Yang, Laakso & Viikari, 1997). There is evidence that for a growing number of children and young people, school provides the main opportunity for regular, structured sports and physical activity, as a combination of economic pressures and parental concerns for safety mean that fewer children are able to play games in non school settings. Physical education, physical activity, and sports in schools all are associated with students' having better physical fitness. Longitudinal data have shown that for each weekday that normal weight adolescents participated in physical education, the odds of becoming an overweight adult decreased by five percent (Menschik, Ahmed, Alexander & Blum, 2008).

Physical education presents an obvious social influencer for sports and physical activity. Most curricula around the world aim to promote a combination of regular physical activity, movement skill development and understanding (Bailey & Dismore, 2005). It seems to be the case that the outcomes are most positive when the school as a whole works to encourage participation (Sallis et al., 2001). This is probably because the messages from the different aspects of the school day can - if appropriately planned and managed - operate synergistically to exert a positive influence on children and young people. On the other hand, another consequence of school's reach into children and people's lives is that negative experiences are likely to have especially harmful effects. For example, teenage girls report that inappropriate physical education experiences are the strongest factor discouraging participation in sport (Kirk, Fitzgerald, Wang & Biddle, 2000).

There are numerous contexts linked to schools for encouraging and reinforcing sports and other physical activities (Jago & Baranowski, 2004). Taken as a whole, the school becomes a very compelling influencer, not least because it works with a captive audience for approximately 40-45% of children and young people's waking hours, during a period when they are most receptive for health messages / attitudinal / behavior change (Harris & Elbourn, 1997). As with all social influencers, however, the intensity of its influence changes over time. Research suggests that attitudes towards physical education, and school in general, are most positive during elementary school. While boys tend to maintain enthusiasm towards sports into their teenaged years, girls often experience a marked decline in positive attitudes from around 13/14 years of age (Dismore, 2006).

Table 1 summarizes the ways in which different social factors influence the physical activity behaviors of children and young people.

Conclusions

There seems little doubt that sports and other forms of physical activity can make valuable contributions to human health and well

being. Physical health outcomes of regular exercise are now widely accepted by policymakers, teachers, parents and other stakeholders, whilst the other benefits, such as educational achievement, social skills, and financial security, have only recently begun to reach the necessary 'tipping point' of public appreciation and political will. Overall, though, the case for regular sports and physical activity as a necessary feature of the good life, especially during childhood, seem unarguable. However, there are reasons to be cautious. Politicians continue to conflate the case for physical-activity-for-all with the largely illusory (and probably unconnected) benefits of glossy mega-events. By doing so, they redirect funds best-spent on mass engagement to the masturbatory pleasures of elite sports (Green & Houlihan, 2005). Of less harm, although still worth considering, is the conventional focus of interest and investment on sports and physical activity's role in combatting physical ill health. This is understandable in light of the compelling and urgent need to address such problems, but there is a danger of excluding other outcomes. This would be unfortunate as the cases for each of the forms of Human Capital - Emotional, Individual, Intellectual, Financial, and Social - are also compelling, and - although frequently ignored in discussions on this topic - the tone and totality of the HCM shift conversations from a negative discourse (associated with issues like cigarette smoking and drug abuse) to a positive one. In other words, the HCM offers physical activity not just (or mainly) as a solution to deadly problems, but also as a source of positive learning, achievement, and happiness.

Perhaps the greatest danger, though, is complacency. Whilst it is true that regular sports and physical activity can lead to improvements in, for example, cognitive functioning, self-esteem, school grades, and economic achievement, it is absolutely not the case that these outcomes will necessarily follow. Negative, inappropriate physical activity provision will either have no positive effect, or a harmful effect. Bad coaching can damage children and young people's self-esteem more potently than good coaching can enhance it. A range of mediating factors, which are primarily social factors, significantly influence the extent to which sports become positive nurturing, joyous activities, or negative, damaging poisonous ones. As discussed here, parents, siblings, peers, schools, and other factors all leave their mark on the developing individual, and all of them can potentially influence participation in sports and physical activities.

The whole period of childhood, from infancy to puberty, can be considered the critical life phase in the development of predispositions to act or behave in certain ways. This has enormous implications for sports and physical activities as it suggests that parents lay foundations of participation during the first decade of life. The propensity to be physically active and to engage in sports is set during childhood (Wheeler, 2012). Of course, human behavior is too complex to be 'determined' from an early age, in a restricted sense. Different social factors leave their marks throughout the life course. However, it seems reasonable to suggest that those wishing to promote an active lifestyle among children and young people will need to recognize the effect of social influences, and plan their strategies accordingly.

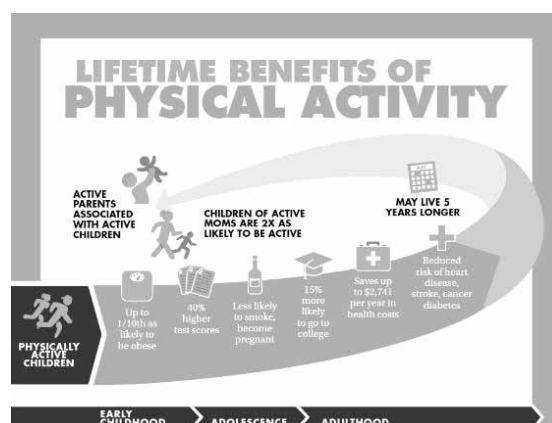


Figure 3: The Human Capitals Act Synergistically
For sources, see Bailey, Hillman, Arent and Petipias (2013).

		0-6 years	6-12 years	12-18 years
Parents	Intensity of influence	High	High-moderate	Moderate-Low
	Form of influence	Encouragement Role-Modeling	Role-Modeling Facilitation Involvement	Facilitation
Siblings	Intensity of influence	High-moderate	Moderate	Moderate
	Form of influence	Encouragement Role-Modeling	Encouragement Role-Modeling Involvement	Role-Modeling Involvement
Friends	Intensity of influence	Moderate	High-moderate	High
	Form of influence	Involvement	Role-Modeling Involvement	Role-Modeling Facilitation Involvement
School	Intensity of influence	----	High	Moderate
	Form of influence	----	Encouragement Role-Modeling Facilitation	Encouragement Role-Modeling Facilitation Involvement

References

- Allen, J. (2003). Social Motivation in Youth Sport. *Journal of Sport and Exercise Psychology*, 25, 551-567.
- American College of Sports Medicine. (2011). "Exercise is medicine," an initiative led by the American College of Sports Medicine. Retrieved from <http://www.exercisemedicine.org/public.htm>.
- Anderssen, N., & Wold, B. (1992). Parental and peer influences on leisure-time physical activity in young adolescents. *Research Quarterly for Exercise and Sport*, 63(4), 341-348.
- Babkes Stellino, M., Partridge, J.A., & Moore, K. (2012). Social influence on emotion and coping: En J. Thatcher, M. Jones & D. Lavallee (Eds.), *Coping and emotion in sport* (2nd ed.) (pp. 145-166). New York: Nova Science Publishers.
- Bailey, R.P. (2006). Physical Education and Sport in Schools: a review of benefits and outcomes. *Journal of School Health*, 76(8), 397-401.
- Bailey, R.P. & Dismore, H. (2005). *Sport in Education: the Place of Physical Education and Sport in Schools (the SpinEd world-wide study)*. Berlin: International Council for Sport Science and Physical Education.
- Bailey, R.P., Collins, D., Ford, P., MacNamara, A., Toms, M. & Pearce, G. (2009). *Participant Development in Sport: an Academic Review*. Leeds: Sports Coach UK.
- Bailey, R., Wellard, I., & Dismore, H. (2004). *Girls' participation in physical activities and sports: Benefits, patterns, influences and ways forward. Technical Report*. Geneva: WHO.
- Bailey, R.P., Hillman, C., Arent, S., & Petitpas, A. (2013). Physical activity: an underestimated investment in human capital? *Journal of Physical Activity and Health*, 10, 289-308.
- Bailey, R.P., Hillman, C., Arent, S., & Petitpas, A. (2012). Physical Activity as an Investment in Personal and Social Change: The Human Capital Model. *Journal of Physical Activity and Health*, 9, 1053-1055.
- Bandura, A. (2001). Social cognitive theory: An agentive perspective. *Annual Review of Psychology*, 52, 1-26.
- Baxter-Jones, A.D.G., & Maffulli, N. (2003). Parental influence on sport participation in elite young athletes. *Journal of Sports Medicine and Physical Fitness*, 43(2), 250-255.
- Baumeister, R.F., & Leary, M.R. (1995). The need to belong: Desire for interpersonal attachments as a fundamental human motivation. *Psychological Bulletin*, 117(3), pp. 497-529.
- Becker, G.S. (1964). Human Capital. Chicago: University of Chicago Press.
- Beets, M., Bornstein, D., Dowda, M., & Pate, R. (2011). Compliance with national guidelines for physical activity in US preschoolers: measurement and interpretation. *Pediatrics*, 127, 658-664.
- Bonow, R.O., Smaha, L.A., Smith, S.C., Mensah, G.A. & Lenfant, C. (2002). World Heart Day: The international burden of cardiovascular disease: Responding to the emerging global epidemic. *Circulation*, 106(13), 1602-1605.
- Booth, M.L., Owen, N., Bauman, A., Clavisi, O. & Leslie, E. (2000). Social-cognitive and perceived environmental influences associated physical activity in older Australians. *Preventive Medicine*, 31(1), pp. 15-22.
- Breuer, C., & Pawlowski, T. (2011). Socioeconomic perspectives on physical activity and aging. *European Review of Aging and Physical Activity*, 8(2), 53-56.
- Bronfenbrenner, U. (1993). The ecology of cognitive development: Research models and fugitive findings. En R.H. Wozniak & K.W. Fischer (Eds.), *Development in context: Acting and thinking in specific environments* (pp. 3-44). Hillsdale, NJ: Erlbaum.
- Brustad, R.J. (1996). Attraction to physical activity in urban schoolchildren: Parental socialization and gender influences. *Research quarterly for exercise and sport*, 67(3), 316-323.
- Brustad, R.J. (1992). Integrating socialisation influences into the study of children's motivation in sport. *Journal of Sport and Exercise Psychology*, 14(1), 59-77.
- Chase, M., & Dummer, G. (1992). The role of sport as a social status determinant for children. *Research Quarterly for Exercise and Sport*, 63(4), 418-424.
- Cicirelli, V.G. (1995). *Sibling relationships across the lifespan*. New York: Plenum Press.
- Collins, D., Bailey, R.P., Ford, P., MacNamara, Á., Toms, M., & Pearce, G. (2012). Three Worlds: New directions in participant development in sport and physical activity. *Sport, Education and Society*, 17(2), 225-243.
- Côté, J. (1999). The influence of the family in the development of talent in sport. *The Sport Psychologist*, 13(4), 395-417.
- Côté, J., & Hay, J. (2002). Children's Involvement in Sport: A Developmental Perspective. En J.M. Silva & D. Stevens (Eds.), *Psychological foundations of sport* (pp. 484-502). Boston, MA: Allyn and Bacon.
- Craig, C. L., Lambert, E. V., Inoue, S., Alkandari, J. R., Leetongin, G., & Kahlmeier, S. (2012). The pandemic of physical inactivity: global action for public health. *The Lancet*, 380(9838), 294-305.
- Craig, R., Mindell, J., & Hirani, V. (2009). Health Survey for England 2008. Volume 1: Physical Activity and Fitness. *Health Survey for England*, 8-395.
- Craigie, A.M., Lake, A.A., Kelly, S.A., Adamson, A.J., & Mathers, J.C. (2011). Tracking of obesity-related behaviours from childhood to adulthood: a systematic review. *Maturitas*, 70(3), 266-284.
- Davis, N.W., & Meyer, B.B. (2008). When siblings becomes competitor: A qualitative investigation of some-sibling competition in elite sport. *Journal of Applied Sport Psychology*, 20, 342-347.
- Davison, K.K. (2004). Activity-related support from parents, peers, siblings and adolescents' physical activity: are there gender differences? *Journal of Physical Activity & Health*, 1, 363-376.
- Britain, G., & Donaldson, L.J. (2004). *At least five a week: Evidence on the impact of physical activity and its relationship to health*. London: Department of Health.
- Dismore, H. (2006). *Primary/Secondary School Transitions in Physical Education*. Unpublished Doctoral Thesis, University of Kent.
- Eccles, J.S., & Harold, R.D. (1991). Gender differences in sport involvement: Applying the expectancy-value model. *Journal of Applied Sport Psychology*, 3(1), 7-35.
- Edwardson, C.L., & Gorely, T. (2010). Parental influences on different types and intensities of physical activity in youth: A systematic review. *Psychology of Sport and Exercise*, 11(6), 522-535.
- Evans, J.M.M., Shelia, C.M., Kirk, A., & Crombie, I.K. (2009). Tracking of physical activity behaviours during childhood, adolescence and young adulthood: a systematic review. *Journal of Epidemiology and Community Health*, 63(Suppl 2), 9-9.
- Fraser-Thomas, J., & Côté, J. (2006). Youth sports: Implementing findings and moving forward with research. *Athletic Insight*, 8(3), 12-27.
- Gandhi, S. (2010). *Parent-Youth Associations of Physical Activity and the Influence of Family and Neighbourhood Social Factors*. Unpublished Dissertation, Université de Montréal.
- Gould, D., Lauer, L., Rolo, C., Jannes, C., & Pennisi, N. (2008). The Role of Parents in Tennis Success: Focus Group Interviews with Junior Coaches. *The Sport Psychologist*, 22, 18-37.
- Gray, W.N., Janicke, D.M., Ingerski, L.M., & Silverstein, J.H. (2008). The impact of peer victimization, parent distress and child depression on barrier formation and physical activity in overweight youth. *Journal of Developmental and Behavioral Pediatrics*, 29(1), 26-33.
- Green, M., & Houlihan, B. (2005). *Elite Sport Development: Policy learning and political priorities*. London: Routledge.
- Greendorfer, S., Lewko, J., & Rosengren, K. (2002). Family and Gender-based Influences in Sport Socialization of Children and Adolescents. En F. Smoll & R. Smith (Eds.), *Children and Youth in Sport: a biopsychosocial perspective* (2nd Edition) (pp.153-186). Dubuque, IA: Kendal/Hunt.
- Grolnick, W.S., Deci, E.L., & Ryan, R.M. (1997). Internalization within the

- family: The Self-Determination Theory perspective. In J.E. Grusec & L. Kuczynski (eds), *Parenting and children's internalization of values: A handbook of contemporary theory* (pp. 135-161). Hoboken, NJ: John Wiley & Sons.
- Hardy, L.L., Kelly, B., Chapman, K., King, L., & Farrell, L. (2010). Parental perceptions of barriers to children's participation in organised sport in Australia. *Journal of paediatrics and child health*, 46(4), 197-203.
- Harris, J., & Elbourn, J. (1997). *Teaching Health-Related Exercise at Key Stages 1 and 2*. Champaign, IL: Human Kinetics.
- Harris, J.R. (2011). *The Nurture Assumption: why children turn out the way they do*. New York: Free Press.
- Horn, T.S., & Weiss, M.R. (1991). A developmental analysis of children's self-ability judgments in the physical domain. *Pediatric Exercise Science*, 3(4), 310-326.
- Humpel, N., Owen, N., & Leslie, E. (2002). Environmental factors associated with adults' participation in physical activity: a review. *American journal of preventive medicine*, 22(3), 188-199.
- IWG, S. (2008). Harnessing the power of sport for development and peace: recommendations to governments. *Toronto: Sport for Development and Peace International Working Group*.
- Jago, R., & Baranowski, T. (2004). Non-curricular approaches for increasing physical activity in youth: a review. *Preventive medicine*, 39(1), 157-163.
- Janz, K.F., Burns, T.L., & Levy, S.M. (2005). Tracking of activity and sedentary behaviors in childhood: the Iowa Bone Development Study. *American journal of Preventive Medicine*, 29(3), 171-178.
- Kirk, D., Carlson, T., O'Connor, T., Burke, P., Davis, K., & Glover, S. (1997). The economic impact on families on children's of children participation in junior sport. *Australian Journal of Science and Medicine in Sport*, 29(2), 27-33.
- Kirk, D., Fitzgerald, H., Wang, J., & Biddle, S. (2000). *Towards Girl-Friendly Physical Education: the Nike/YST Girls in Sport Partnership Project – Final Report*. Loughborough: Institute for Youth Sport.
- Kjonniksen, L., Anderssen, N., & Wold, B. (2009). Organized youth sport as a predictor of physical activity in adulthood. *Scandinavian Journal of Medicine and Science in Sports*, 19(1), 646-654.
- Krane, V. (2001). We can be athletic and feminine, but do we want to? Challenging hegemonic femininity in women's sport. *Quest*, 53(1), 115-133.
- Light, R., & Lemonie, Y. (2010). A case study on children's reasons for joining and remaining in a French swimming club. *Asian Journal of Exercise and Sports Science*, 7(1), 27-33.
- Light, R., Harvey, S., & Memmert, D. (2013). Why children join and stay in sports clubs: Case studies in Australian, French and German swimming clubs. *Sport, Education and Society*, 18(4), 550-566.
- Mattocks, C., Ness, A., Deere, K., Tilling, K., Leary, S., Blair, S.N., & Riddoch, C. (2008). Early life determinants of physical activity in 11 to 12 year olds: cohort study. *British Medical Journal*, 336(7634), 26-29.
- McMinn, A.M., van Sluijs, E.M.F., Wedderkopp, N., Frobers, K., & Griffin, S.J. (2008). Sociocultural correlates of physical activity and adolescents: findings from the Danish Arm of the European Youth Heart Study. *Pediatric Exercise Science*, 20(3), 319-332.
- Menschik, D., Ahmed, S., Alexander, M.H., & Blum, R.W. (2008). Adolescent Physical Activities as Predictors of Young Adult Weight. *Archives of Pediatrics and Adolescent Medicine*, 162(1), 29-33.
- Miller, S.C. (2011). *Families Moving Together: Increasing Physical Activity by Targeting Parents Exclusively versus Parents Together with Children*. Unpublished Doctoral Thesis, Texas State University-San Marcos.
- Moore, L.L., Lombardi, D.A., White, M.J., Campbell, J.L., Oliveria, S.A., & Ellison, R.C. (1991). Influence of parents' physical activity levels on activity levels of young children. *The Journal of pediatrics*, 118(2), 215-219.
- Nike, (2012). *Designed to Move: A Physical Activity Action Agenda*. Retrieved from https://www.designedtomove.org/en_us/.
- Partridge, J.A., Brustad, R.J., & Babkes Stellino, M. (2008). Social influence in sport. En T.S. Horn (Ed.), *Advances in sport psychology* (3rd ed) (pp. 269-291). Champaign, IL: Human Kinetics.
- Pate, R.R., Heath, G.W., Dowda, M., & Trost, S.G. (1996). Associations between physical activity and other health behaviors in a representative sample of US adolescents. *American Journal of Public Health*, 86(11), 1577-1581.
- Payne, W., Reynolds, M., Brown, S., & Fleming, A. (2003). *Sports Role Models and their Impact on Participation in Physical Activity: a literature review*. Carlton South, Victoria, Australia: VicHealth.
- Pellegrini, A. D., & Smith, P. K. (1998). Physical activity play: the nature and function of a neglected aspect of play. *Child Development*, 69(3), 577-598.
- Pickard, A., & Bailey, R.P. (2009). Crystallising Experiences Among Young Elite Dancers. *Sport, Education and Society*, 14(2), 165-181.
- Rittenhouse, M., Salvy, S.J., & Barkley, J.E. (2011). The effect of peer influence on the amount of physical activity performed in 8- to 12-year-old boys. *Pediatric Exercise Science*, 23(1), 49-60.
- Rubin, K.H., Bukowski, W., & Parker, J.G. (2006). Peer interactions, relationships, and groups. En W. Damon, R.M. Lerner & N. Eisenberg (Eds.), *Handbook of child psychology: Vol. 3, Social, emotional, and personality development*. (6th Edition) (pp. 571-645). New York: Wiley.
- Sallis J., & Owen N. (1999). *Physical Activity and Behavioral Medicine*. Thousand Oaks, CA: Sage.
- Sallis, J.F., Conway, T.L., Prochaska, J.J., McKenzie, T.L., Marshall, S.J., & Brown, M. (2001). The association of school environments with youth physical activity. *American Journal of Public Health*, 91(1), 618-620.
- Salvy, S.J., Roemmich, J.N., Bowker, J.C., Romero, N.D., Stadler, P.J., & Epstein, L.H. (2008). Effect of peers and friends on youth physical activity and motivation to be physically active. *Journal of Pediatric Psychology*, 34(2), 217-225.
- Savin-Williams, R.C., & Berndt, T.J. (1990). Friendship and peer relations. In S.S. Feldman & G.R. Elliott (Eds.), *At the threshold: the developing adolescent* (pp. 277-307). Cambridge, MA: Harvard University Press.
- Schilling, T.A., & Hayashi, C.T. (2001). Achievement motivation among high school basketball and cross-country athletes: A personal investment perspective. *Journal of Applied Sport Psychology*, 13(1), 103-128.
- Siedentop, D. (2002). Junior Sport and the Evolution of Sport Cultures. *Journal of Teaching in Physical Education*, 21(4), 392-401.
- Sisson, S.B., & Katzmarzyk, P.T. (2008). International prevalence of physical activity in youth and adults. *Obesity Reviews*, 9(6), 606-614.
- Smoll, F.L., & Smith, R.E. (1996). Competitive Anxiety: Sources, Consequences, and Intervention Strategies. En F.L. Smoll & R.E. Smith (Eds.), *Children and youth in sport: a biopsychosocial perspective*. Brown & Benchmark: McGraw-Hill.
- Spence, J.C., & Lee, R.E. (2003). Toward a comprehensive model of physical activity. *Psychology of Sport Exercise*, 4(1), 7-24.
- Standage, M., Duda, J.L., & Ntoumanis, N. (2003). A model of contextual motivation in physical education: Using constructs from self-determination and achievement goal theories to predict physical activity intentions. *Journal of educational psychology*, 95(1), 97.
- Sulloway, F. (1996). *Born to Rebel*. New York: Pantheon Books.
- Telama, R., Yang, X., Laakso, L., & Viikari, J. (1997). Physical Activity in Childhood and Adolescence as Predictor of Physical Activity in Adulthood. *American Journal of Preventive Medicine*, 13(1), 317-323.
- Walters, S. (2011). *The Effects of Adult Involvement on Children Participating in Organised Team Sports*. Unpublished Doctoral Thesis, Auckland University of Technology.
- Wang, F., & Veugelaers, P.J. (2008). Self esteem and cognitive development in the era of the childhood obesity epidemic. *Obesity reviews*, 9(6), 615-623.
- Welk, G. (1999a). *Promoting physical activity in children: Parental influences*. ERIC Clearinghouse on Teaching and Teacher Education.
- Welk, G.J. (1999b). The youth physical activity promotion model: A conceptual bridge between theory and practice. *Quest*, 51(1), 5-23.
- Wheeler, S. (2012). The significance of family culture for sports participation. *International Review for the Sociology of Sport*, 47(2), 235-252.
- World Health Organization (2005). *Facing the Facts #1: Chronic Diseases and Their Common Risk Factors*. Geneva: WHO.

(Footnotes)

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² https://www.designedtomove.org/en_us/

³ The HCM is an element in a wider, international program of research and advocacy entitled 'Designed to Move'. Further information is available from: <https://www.designedtomove.org/>.

